

WE CLAIM:

1. An in-line formed, non-laminated web, the web having major surfaces in the X-Y plane and a depth in the Z direction, the web suitable for use as a fluid distribution and fluid retention web in a disposable absorbent article, comprising:

- a) multiple layers of composite material;
- b) the multiple layers having different compositions;
- c) at least two of the multiple layers being in an opposing relation and overlaid in the Z-axis direction of the web thereby creating a gradient in the Z-direction of the web;
- d) at least one of the multiple layers having zones of intermittent material deposition in one of a machine direction or a cross direction so as to have discontinuous zones in one of the machine direction or the cross direction; and
- e) whereby the composite web has a Z-direction gradient of material layers; and zones of different material layers intermittently placed in one of the machine direction or the cross direction.

2. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 1, further comprising: the gradient further being in a type of absorbent in each material layer.

3. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 2, wherein the type of absorbent may be selected between a species of absorbent such as superabsorbent materials or wood pulps, or selected among a varieties of absorbents within such species.

4. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 1, further comprising: the gradient further being in an amount of absorbent in each material layer.

5. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 1, wherein the amount of absorbent is varied by weight percent.

6. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 1, further comprising: the gradient being in a type of thermoplastic fiber in each material layer.

7. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 6, wherein the gradient is a type of polymer used for the thermoplastic fibers.

8. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 6, wherein the gradient is a denier of the thermoplastic fibers.

9. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 1, further comprising: the gradient being in an amount of thermoplastic fiber in each material layer.

10. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 9, wherein the amount of thermoplastic fiber in each material layer is varied by weight percent.

11. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 1, further comprising: the gradient being in differing densities of the material layers.

12. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 1, further comprising: the gradient being in differing thicknesses of the material layers.

13. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 1, further comprising: the zone further being intermittent in a type of absorbent in each material layer.

14. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 13, wherein the type of absorbent may be selected between a species of absorbent such as superabsorbent materials or wood pulps, or selected among a varieties of absorbents within such species.

15. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 1, further comprising: the zone further being intermittent in an amount of absorbent in each material layer.

16. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 15, wherein the amount of absorbent is varied by weight percent.

17. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 1, further comprising: the zone being intermittent in a type of thermoplastic fiber in each material layer.

18. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 17, wherein the gradient is a type of polymer used for the thermoplastic fibers.

19. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 17, wherein the gradient is a denier of the thermoplastic fibers.

20. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 1, further comprising: the zone being intermittent in an amount of thermoplastic fiber in each material layer.

21. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 20, wherein the amount of thermoplastic fiber in each material layer is varied by weight percent.

22. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 1, further comprising: the zone being intermittent in a differing densities of the material layers.

23. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 1, further comprising: the zone being intermittent in differing thicknesses of the material layers.

24. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 1, further comprising: the web having no discrete boundaries between the multiple layers of material.

25. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 1, further comprising: the web having tissue boundaries between at least some of the multiple layers.

26. An in-line formed web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article according to Claim 1, wherein the material is in the form of air laid material.

27. An in-line formed, non-laminated web, the web having major surfaces in the X-Y plane and a depth in the Z direction, the web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article, comprising:

a) multiple layers of air laid composite material, at least two of the multiple layers comprising both thermoplastic fibers and absorbent material;

b) the at least two multiple layers having different compositions of thermoplastic fibers and absorbent material;

c) the at least two multiple layers being in an opposing and adjacent relation and overlaid in the Z-axis direction of the web thereby creating a gradient in the Z-direction of the web;

d) at least one of the multiple layers having zones of intermittent material deposition in one of a machine direction or a cross direction so as to have discontinuous zones in one of the machine direction or the cross direction;

e) the web having no discrete boundaries between the multiple layers of air laid material; and

f) whereby the composite web has a Z-direction gradient of air laid material layers; and zones of different material layers intermittently placed in one of the machine direction or the cross direction.

28. An in-line formed non-laminated web, the web having major surfaces in the X-Y plane and a depth in the Z direction, the web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article, comprising:

a) multiple layers of air laid composite material comprising both thermoplastic fibers and absorbent material;



b) the multiple layers creating gradients in the Z-direction having different compositions of thermoplastic fibers and absorbent material including at least one of a different composition selected from the group including: a type of absorbent in each air laid material layer, an amount of absorbent in each air laid material layer, a type of thermoplastic fiber in each air laid material layer, an amount of thermoplastic fiber in each air laid material layer, differing densities of the air laid material layers, and differing thicknesses of the air laid material layers;

c) at least two of the multiple layers being in an opposing and adjacent relation and overlaid in the Z-axis direction of the web thereby creating a gradient in the Z-direction of the web;

d) at least one of the multiple layers having zones of intermittent material deposition in one of a machine direction or a cross direction so as to have discontinuous zones in one of the machine direction or the cross direction; and

e) whereby the composite web has a Z-direction gradient of air laid material layers; and zones of different material layers intermittently placed in one of the machine direction or the cross direction.

29. An in-line formed non-laminated web, the web having major surfaces in the X-Y plane and a depth in the Z direction, the web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article, comprising:

a) multiple layers of air laid composite material comprising both thermoplastic fibers and absorbent material;

b) at least one of the multiple layers having zones of intermittent composition change of thermoplastic fibers, or absorbent material, or both, including at least one of a different composition selected from the group including the zones being intermittent in a type of absorbent in each air laid material layer, being intermittent in an amount of absorbent in each air laid material layer, being intermittent in a type of thermoplastic fiber in each air laid material layer, being intermittent in an amount of thermoplastic fiber in each air laid material layer, being intermittent in differing densities of the air laid material layers, and being intermittent in differing thicknesses of the air laid material layer;

c) at least two of the multiple layers being in an opposing and adjacent relation and overlaid in the Z-axis direction of the web thereby creating a gradient in the Z-direction of the web;

d) at least one of the multiple layers having zones of intermittent material deposition in one of a machine direction or a cross direction so as to have discontinuous zones in one of the machine direction or the cross direction; and

e) whereby the composite web has a Z-direction gradient of air laid material layers; and zones of different material layers intermittently placed in one of the machine direction or the cross direction.

30. An in-line formed non-laminated web, the web having major surfaces in the X-Y plane and a depth in the Z direction, the web suitable for use as a composite fluid distribution and fluid retention layer in a disposable absorbent article, comprising:

a) multiple layers of air laid composite material comprising both thermoplastic fibers and absorbent material;

b) the multiple layers having different compositions of thermoplastic fibers and absorbent material including two or more different compositions selected from the group including: a type of absorbent in each air laid material layer, an amount of absorbent in each air laid material layer, a type of thermoplastic fiber in each air laid material layer, an amount of thermoplastic fiber in each air laid material layer, differing densities of the air laid material layers, and differing thicknesses of the air laid material layer, the zones being intermittent in a type of absorbent in each air laid material layer, being intermittent in an amount of absorbent in each air laid material layer, being intermittent in a type of thermoplastic fiber in each air laid material layer, being intermittent in an amount of thermoplastic fiber in each air laid material layer, being intermittent in differing densities of the air laid material layers, being intermittent in differing thicknesses of the air laid material layer;

c) at least two of the multiple layers being in an opposing and adjacent relation and overlaid in the Z-axis direction of the web thereby creating a gradient in the Z-direction of the web;

d) at least one of the multiple layers having zones of intermittent material deposition in one of a machine direction or a cross direction so as to have discontinuous zones in one of the machine direction or the cross direction; and

e) whereby the composite web has a Z-direction gradient of air laid material layers; and zones of different material layers intermittently placed in one of the machine direction or the cross direction.